

ABSTRACT OF THE DISCLOSURE

The present invention is directed to a method for clamping and processing
5 a semiconductor substrate using a semiconductor processing apparatus.
According to one aspect of the present invention, a multi-polar electrostatic chuck
and associated method is disclosed which provides heating or cooling of a
substrate by thermal contact conduction between the electrostatic chuck and the
substrate. The multi-polar electrostatic chuck comprises a semiconductor
10 platform having a plurality of protrusions that define gaps therebetween, a
surface roughness of the plurality of protrusions is less than 100 Angstroms. The
electrostatic chuck further comprises a voltage control system operable to control
a voltage applied to the electrostatic chuck to thus control a contact heat transfer
coefficient of the electrostatic chuck, wherein the heat transfer coefficient of the
15 electrostatic chuck is primarily a function of a contact pressure between the
substrate and the plurality of protrusions.

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